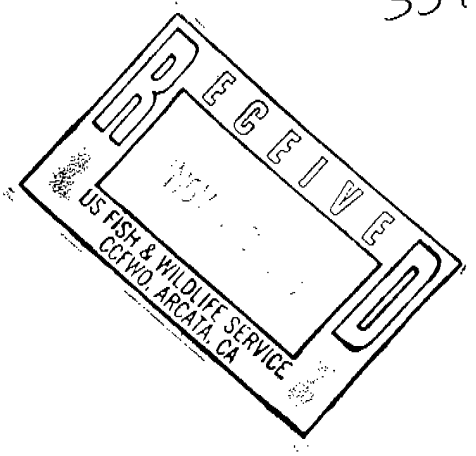
5512



Bruce Halstead, US Fish & Wildlife Service
1125 16th Street, Room 209
Arcata, CA 95521
fax (707) 822-8411

Re: Permit numbers PRT-828950 and 1157.

And

John Munn
California Department of Forestry
1416 Ninth Street
Sacramento, CA 95814
fax (916) 653-8957

Re: SYP 96-002

JNL-1

1) The Landscape Assessment of Geomorphic Sensitivity (LAGS) is inadequate to identify existing impacts and site conditions and failure mechanisms and therefore to prevent significant adverse impacts following proposed operations. The resolution of PL's virtual reality GIS is not discussed, but from the GIS maps found in the SYP/HCP the resolution appears to be at best 30 feet. The modeling program for slope stability was not good enough to predict the Stafford Landslide or the slides in NF Elk (on THP 94-360 or 93-502). A full series of aerial photos and anlysis including: the frequency and volume of failure incidents, occurrence rate per storm event, failure mechanism, and sensitivity of downstream low gradient is appropriate and is the minimum required to demonstrate compliance with the FPR's, the Basin Plan objectives, the 303(d) listing, and conservation and recovery of coho salmon. The SYP must adopt measures which "demonstrate the sound principles of the State FPR's by adjusting protection focus to species in decline as it becomes necessary." (DFG Memo 2/3/95)

To determine the likely veracity of this vague and confusing Landscape Assessment of Geomorphic Sensitivity process (LAGS), 36 THP slide sites investigated by DMG on the ground were pulled from the CDF files (THP's herein incorporated by reference) The attached spreadsheet provides pertinent information needed to compare the relative likelihood that a given erosional feature would undergo review under the LAGS process. Fifteen of 36 sites that received review by DMG would not have received review by PL's in-house geologist under the LAGS process. In addition, this process is inaccurate, misleading, and is not adequate to identify reasonably potential significant adverse impacts or prevent cumulative effects.

PL has over 250 violations, these have resulted in both significant and incremental impacts that are not evaluated in the plan. The Supreme Court of California has established that this kind of record must be considered in any project approval:

"Because an environmental impact report cannot be meaningfully considered in a vacuum devoid of reality, a project proponent's prior environmental record is properly a subject of close consideration in determining the sufficiency of the proponent's promises in an environmental report....In balancing a proponent's prior shortcomings and its promises for future action, a court should consider relevant factors including: the length, number, and severity of prior environmental errors and the harm caused; whether the errors were intentional, negligent, or unavoidable: whether the proponent's record has improved or declined: whether he

has attempted to correct prior problems....." -Supreme Court of California, 1988, Laurel Heights v. Regents.

The implication for this plan is that the results of past violations must be included in the estimate of likely erosion rates from the plan. As the Supreme Court found in 1988, "An EIR is an 'environmental alarm bell' whose purpose is to alert the public and its responsible officials to environmental changes before they have reached the point of no return."

2) **Takings of private property and public trust values without due process** JNL-2

Dean Lucke, CDF, stated at the September BOF hearing held in Lake Tahoe "CDF has no obligation or authority to require recovery of the beneficial uses of water." This arrogant response represents an abrogation in performance of CDF's trustee duty, which requires that the trustee not allow the public resource to be degraded. In this case, the trustree has allowed the public resource to be damaged, as demonstrated by the existence of the numerous Cleanup and Abatement Orders issued by Water Quality and the listing of 22 rivers on the north coast as impaired under section 303 (d) of the Clean Water Act. By not requiring recovery, this HCP/SYP would allow PL to continue or increase this level of environmental damage to private property.

3) There is no demonstration as the EIS alleges that "Effects of Alternative 2 or 2a related to timber harvest and road related mass wasting, hillslope and road erosion, and soil productivity are less than significant" (3.6.4.6 Volume 1) In fact recent information demonstrates the contrary: JNL-3

> Significant new information concerning the association of non-road related logging with accelerated landsliding rates has recently come to light due to the enforcement of Regional Water Quality Work Orders in Bear Creek and North Fork Elk River (Abatement Orders 97-115 and 98-100). PL owns all of the Bear Creek watershed and a major portion of the North Fork Elk River. Water Quality staff requested review of the Bear Creek Sediment Source Inventory (see attachment under separate cover) by Dr. Leslie Reid, who is a cumulative effects specialist with the US Forest Service.. Dr. Reid described several patterns of landslide distribution on the Franciscan soils of Bear Creek in a June 19 review (see attachment) and in a June 24, 1998 letter (see attachment) to Frank Reichmuth.
>
> Four findings are particularly relevant to the Franciscan soil on PL lands:
>
> 1) "results suggest that soils of the Bear Creek watershed are not capable of staying on the hillslopes without the help of trees, and that the kinds of selective logging being carried out during the second cycle of logging are of high enough intensity to de stabilize hillslopes."
>
> 2) "The recurrence interval of potential landslide-generating storms is ....on the order of 10 years, which indicates that such storms can be expected to recur on average about twice during each period of active logging (20 years) during a cutting cycle, and about 4 times during the recovery period (40 years)."
>
> 3) "The implication here is that the rate of landsliding on recently cut slopes is 9.6 times greater than on slopes last cut 30 years before". "Thus, logging carried out under the guidance of the most recent versions of Forest Practice Rules contributed directly to an order-of-magnitude increase in sediment production from landsliding compared to an already-disturbed landscape."

4) "similar soil types are found in parts of the Freshwater Creek watershed. Information and conclusions drawn from the Bear Creek watershed are thus potentially relevant in the Frshwater area." JNL-3 CON.

3) The plan would allow sediment impacts in Freshwater to increase and continue: Pete Cafferata's Memo to Dave Ebert, Sept 11, 1998, entitled "Freshwater Creek Cross-Section Re measurement" shows a 12-40% decrease in cross-section area between years 1975 and 1997 for 50 year flood events at (two) locations likely to have been influenced by excessive sedimentation from the Little Freshwater tributary (using grahp paper to calculate area under the 50 year flood line). This reduction will result in increased flood frequency and damage to residents and property. Silviculturally related increases in landslide-mass wasting rates from the ongoing and future harvest and road activities and the resulting sedimentation in low gradient areas are not evaluated adequately by the plan. Nor are these impacts mitigated. Therefore the CE analysis is conclusory and fails in its determination of impacts and mitigation measures (is conclusory because it fails to evaluate facts produced by experts and known to CDF for months; fails.because it does not incorporate Pete Cafferata's recommendationss in the Oct 31, 1997 memo to Tom Osipowich: *"It would, however, be possible for flows to appear higher if mean channel bed elevation were raised due to increased sediment levels. Currently there are no long-term monitoring stationss to determine if this has indeed occurred over time. The highly erodible nature of this watershed dictates that high standard harvesting and roading practices must be implemented to reduce potential hillslope erosion to as low a level as is reasonably possible.* CDF and the Federal agencies fail to adequately consider impacts on the beneficial uses of water--including impacts caused by sedimentation, reduced stream channel conveyance capacity, and, flooding--which damage the environment of concern to residents living downstream, and CDF's ultimate conclusion that the project would not result in significant adverse incremental or cumulative impacts and nuisance is not based upon substantial evidence as required by PRC sections 21168 and 21168.5. The director of CDF must exercise his authority, require sufficient information for a determination, and assure enforcement of the intent of the FRA and Basin Plan objectives regarding water quality and watershed control, and for flood control before he approves this SYP. JNL-4

4) Alternative 3 (3.6.4.4 Volume 1): "Selective harvest should greatly reduce timber harvest related mass wasting". Why are the less damaging environmental effects and benefits of this alternative not evaluated in detail? Do the agencies have a basis under NEPA and CEQA to assume that residents downstream are expendable? The inverse condemnation issue is significant, please give it full evaluation and reopen public comment before approving this plan. JNL-5

5) Class II and III watercourses provide important life cycle refugia for coho, tailed frogs that is not given adequate protection or assessment by this plan. See THP 89-717 JNL-6

6) The loss of canopy and LWD potential recruitment due to stream bank failures related to hydrologic change upslope and cumulative effects from upstream impacts is not evaluated in the determination of riparian buffer widths. Likewise, LWD potential recruitment is reduced by past rip rap projects and the buffer widths should be extended. See THP86-307 JNL-7

7) Chronic turbidity effects on coho are not sufficiently addressed. See 1) attached graphs for Graham Gulch, Freshwater Creek and Bull Creek Tributaries, and 2) Turbidity Induced Changes in Reactive Distance of Rainbow Trout by Dr. Jeff Barrett (55% reduction), 3) Effect of Suspended Sediment on Aquatic Ecosystems, C. P. JNL-8

Newcomb 4) Turbidity as Water Quality Standard for Salmonid Habitats in Alaska, Denby S. Lloyd,

8) Effects of fine sediment and suspended sediment transport on coho survival, recovery and conservation are not adequately evaluated. see Coho Survival from Egg Deposition to Fry Emergence, Jack V Tagert | JNL-9

9) SYP proposes unsustainable levels of impact and harvest. See Exhibit 3 , THP 87-359. The resulting impacts are demonstrated by the following Memos: 97-487 July 23 1998 DFG to Tom O.,,,,July 22, 1998 DFG to CDF | JNL-10

10) PL stands have been cut beyond levels proposed in plan, thereby throwing the SYP projections into question while at the same time decreasing rainfall interception losses and increasing hillslope failure potential due to hydrological change. | JNL-11

11.) The plan does not adequately consider the dramatic increases in earth flow rates due to harvest activities which reduce rainfall interception losses and in addition the stabilizing "rafting" effects of forest blocks. See A Comparison of Earthflow Movement mechanisms on forested and grassed slopes, Xinbao Zhang, 1993 | JNL-12

12) The plan does not adequately consider the narrow temperature requirements of the tailed frog and the effects this plan will have to tailed frogs because of their high site fidelity. | JNL-13

The short period of time and the inavailablity of the documents cries out for re-opening the public comment period. How is it considered possible to read cubic feet of paper in this short period of time. Why the minimum period of time anyway?

Sincerely, Jesse Noell

Jesse Noell

DMG / PL Geomorphic Sensitivity

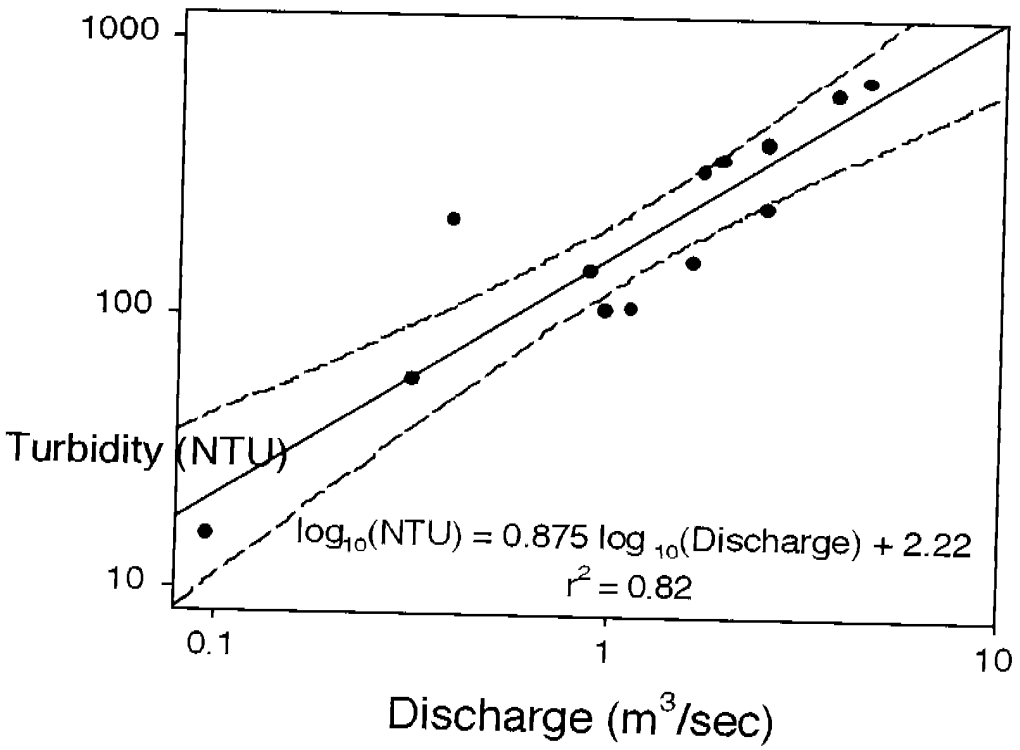
CREEK	THP	ROCK	SLOPE-DMG	SLOPE@SLIDE	%-DMG	SOIL	GEOL	GEOM	SLOPE/EHR	TOTAL
Bear Cr.	94-050	TKfs	9			2	4	10	4	20
Bear Cr.	92-050	TKfs	9	70-100		2	4	10	9	25
Bear Cr.	92-050	TKfs	9			2	4	10	7	23
Bear Cr.	89-158	TKfs								
Bear Cr.	89-571	TKfs	12	80-90 inner gorge		2	4	10	9	25
Bear Cr.	89-571	TKfs	9	70+/-		2	4	10	9	25
Bear Cr.	89-571	TKfs	7	60-		2	4	10	9	25
Bear Cr.	89-571	TKfs	9	70+/-		2	4	10	9	25
Bear Cr.	88-174	TKfs	7	50-60		2	4	5	7	18
Bear Cr.	87-493	TKfs	4	40-50		2	4	5	4	15
Bear Cr.	87-493	TKfs	4	40-50		2	4	5	4	15
Bear Cr.	87-493	TKfs	9	60-70		2	4	5	4	15
Bear Cr.	87-493	TKfs	7	50-60		2	4	5	4	15
Jordan	87-288	TKfs	7	50-60		2	4	10	4	20
Jordan	87-288	TKfs	4	40-50		2	4	10	4	20
Jordan	87-288	TKfs	9	60-110		2	4	10	4	20
Jordan	87-288	TKfs	9	60-70		2	4	10	4	20
Jordan	87-359	TKfs	4	30-40		2	4	5	7	18
Jordan	89-748	TKfs	7	65-		2	4	0	4	10
Greenlaw	91-280	TKfs				2	4			
Jordan	89-748	TKfs	9	60-70		2	4	0	4	10
Dinner	89-374	TKfs	9	50-70		2	4	9	5	20
Dinner	89-374	TKfs	9	60-90		2	4	9	5	20
Twin	86-389	TKfs	4	50-		2	4	7	7	20
Monument	89-278	TKfs	9	80-		2	4	5	1	12
Stitz	87-342	QTwu	9			3	3	10	9	27
Stitz	86-198	QTsb	7	50-60		3	3	5	4	15
Stitz	88-058	TKy	7	30-60		4	3	10	4	21
Stitz	89-026	QTwu				3	3	5	7	18
Stitz	89-052	QTwu	9	60-70		3	3	10	7	23
Stitz	89-826	QTwu	4	50-		3	3	5		
Stitz	89-826	QTwu	7	60-		3	3	5		
Chadd	89-107	TKfs	4	30-50		2	4	5	4	15
Stafford	85-170									
SF Elk	85-398	QTwu	7	50-60		3	3	5	4	15
SF Elk	85-398	QTwu	4	20-50		3	3	5	4	15
SF Elk	85-398	QTwu	4	20-40		3	3	5	4	15
NF Elk	87-192	QTwu	9	60-80		3	3			
NF Elk	89-367	QTwu		30-70		3	3	0	7	13

Data collected by Skeleman Forever

Bull Cr. Tributaries		Graham Gulch	
Discharge	NTU	Discharge	NTU
0.027	2.99	0.095	15.7
0.032	10.7	0.315	59.2
0.041	9.22	0.395	221
0.042	9.09	0.89	145
0.042	14.2	0.97	106
0.042	4.43	1.13	109
0.044	7.5	1.62	158
0.045	24.9	1.72	337
0.053	10.2	1.93	368
0.057	6.99	2.49	430
0.062	3.51	2.49	251
0.064	8.01	3.75	642
0.064	5.89	4.50	730
0.08	7.41		
0.08	15.4		
0.092	11.3		
0.097	27.1		
0.117	10.1		
0.142	11.4		
0.147	7.34		
0.186	53.7		
0.275	23.7		
0.291	78.1		
0.32	22.9		
0.37	25.9		
0.394	12.1		
0.453	40		
0.483	34.5		
0.784	17.6		
1.147	44.9		
1.208	35.7		
1.214	10.3		
1.231	69.8		
1.402	130		

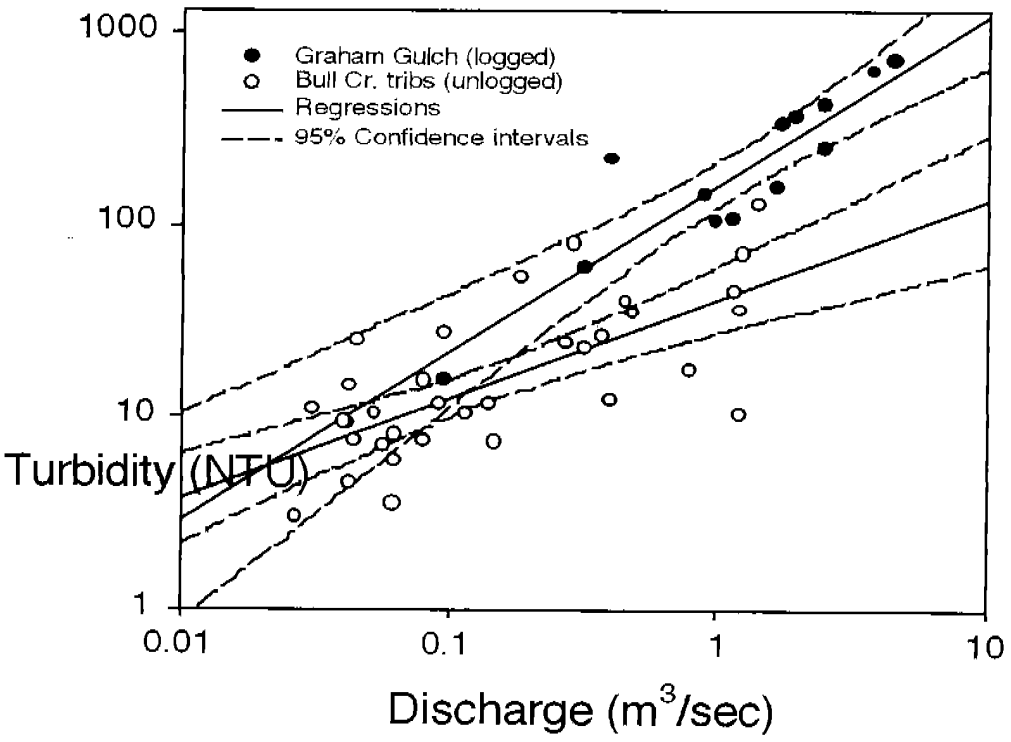
Data Collected by Salmon Forever

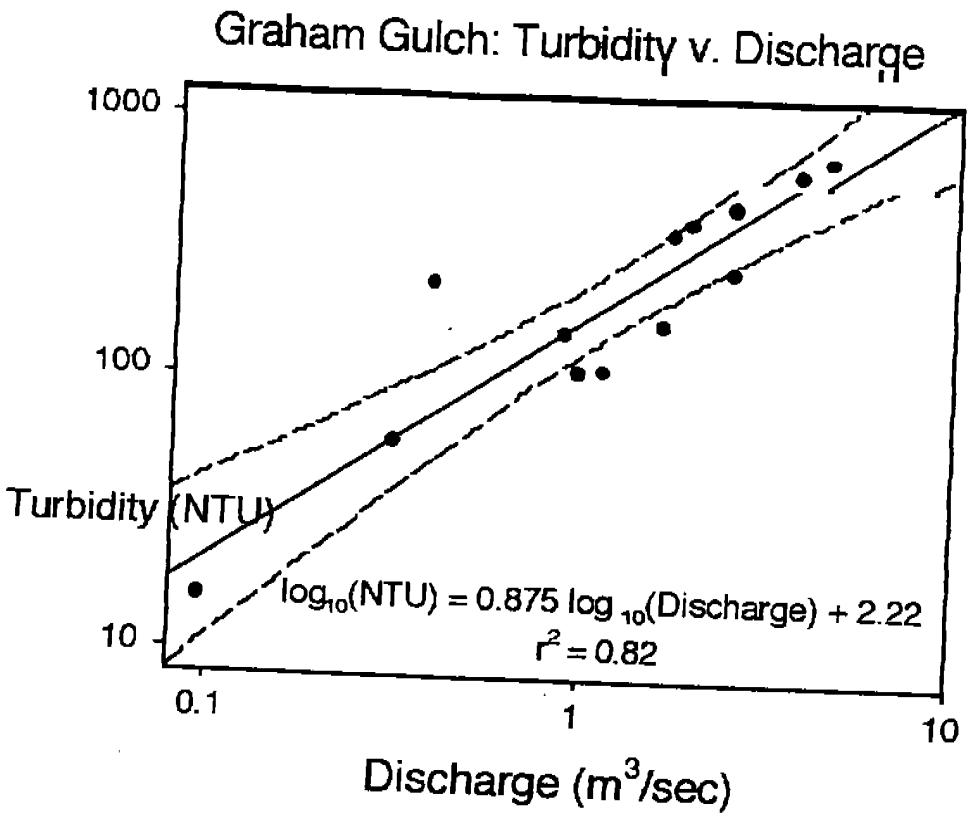
Graham Gulch: Turbidity v. Discharge



Data collected by Salmon Forever

Logged and unlogged tributaries on Franciscan bedrock (Hugo soils)




Graham Gulch: Turbidity v. Discharge
1000
100
10
Turbidity (NTU)
log10(NTU) = 0.875 log 10(Discharge) + 2.22
r2 = 0.82
0.1
1
10
Discharge (m3/sec)

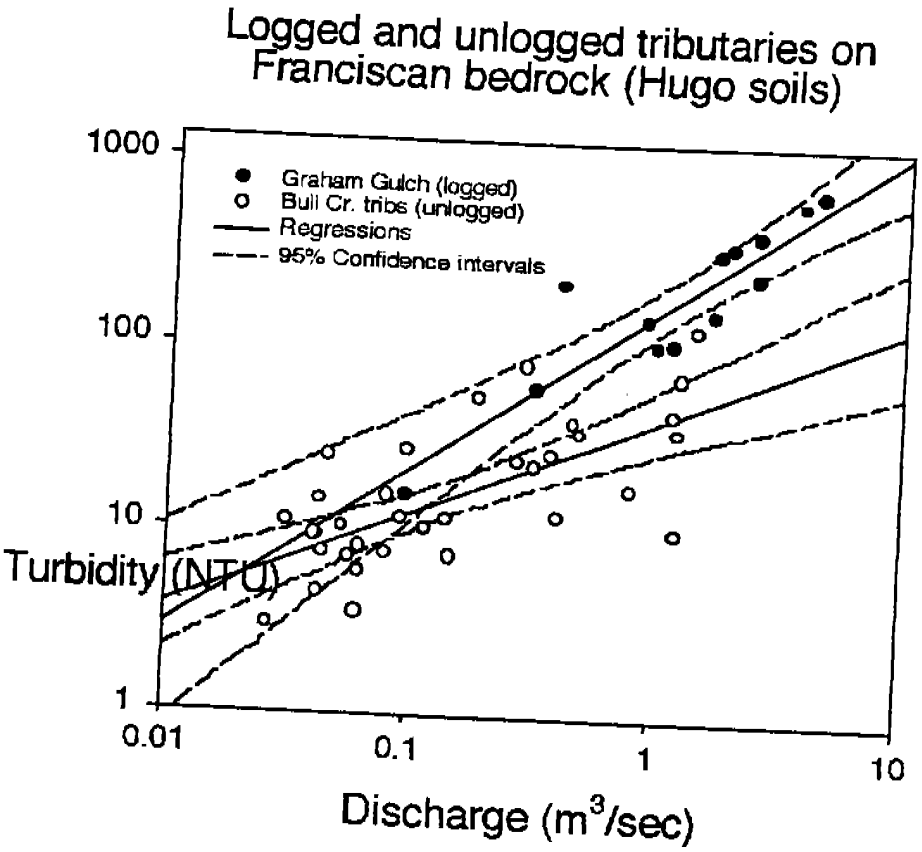

Logged and unlogged tributaries on Franciscan bedrock (Hugo soils)
1000
100
10
1
Turbidity (NTU)
Graham Gulch (logged)
Bull Cr. tribs (unlogged)
Regressions
95% Confidence intervals
0.01
0.1
1
10
Discharge (m3/sec)

Exhibit 3 THH 87-359

ANALYSIS OF THE EFFECTS OF INCREASED HARVESTS ON PACIFIC LUMBER'S FOREST AND THE NORTH COAST ECONOMY

EXECUTIVE SUMMARY

At the request of Pacific Lumber, Hammon, Jensen, Wallen and Associates have investigated the effects of Pacific Lumber's planned increase in harvests on PL's forests and the economy of Humboldt County. Hammon, Jensen, Wallen and Associates are in the final stages of an extensive inventory of Pacific Lumber's timberlands and have comprhensive knowledge of Pacific Lumber's inventory and acreage.

1. Pacific Lumber will not run out of timber if they incease harvests from 1985 levels to planned harvest levels for twenty years.

2. At the end of the twenty year period Pacific Lumber forest will support a substantial timber inventory. The inventory will contain old growth trees. The majority of the forest will, however, be comprised of second growth trees.

3. At the end of the twenty year period, forest volumes and growth will enable Pacific Lumber to reduce harvests to 1985 levels and continue at that harvest level in perpetuity. Thus, Pacific Lumber harvests need never drop below 1985 levels and continuous yield at 1985 levels can be maintained in perpetuity.

4. By increasing harvests without jeopardizing long run continuous flow, Pacific Lumber can play an important role in alleviating the North Coast's employment problems.

5. Pacific Lumber's forests cannot sustain a doubling of 1985 harvests indefinitely. Continuance of double 1985 harvest levels for many years beyond year 20 will result in liquidation of the forest and the creation of an age class gap in 30 to 40 years.

6. Nondeclining evenflow harvest levels are estimated to be 170 MMBF per year or 24 percent above 1985 harvest levels. Long run sustained yield levels are estimated to be 216 MMBF per year or 58 percent above 1985 levels.

State of California

Memorandum

To Joe Fassler	From Mark Moore
Co.	Co.
Dept.	Phone #
Fax #	Fax #

To : Mr. Glen J. Newman, Chief
Coast/Cascade Region
California Department of Forestry and Fire Protection
Post Office Box 670
Santa Rosa, California 95402-0670

Date : July 21, 1998

97-487

RECEIVED
JUL 23 1998
FISH AND GAME
EUREKA, CA

Attention Mr. Thomas Osipowich

From : Department of Fish and Game - Region 1
601 Locust Street, Redding, California 96001

Subject : The Pacific Lumber Company's Sediment Source Investigation and Reduction Plan for Bear Creek Watershed, Humboldt County

The Department of Fish and Game (DFG) has reviewed the Pacific Lumber Company's *Sediment Source Investigation and Sediment Reduction Plan for Bear Creek Watershed, Humboldt County, California* ("the report") prepared by Pacific Watershed Associates (PWA). We offer the following comments.

The DFG finds that PWA's report provided very useful insights into the Bear Creek watershed's geologic setting, history of storm events and forest management and the salient sediment sources and delivery mechanisms. The report highlighted the role of large, episodic storm events in triggering mass wasting, fluvial erosion and surface erosion as well as the effects of these processes on Bear Creek. The report characterized the relatively high frequency and size of mass wasting features that have developed on unroaded inner gorge slopes in the Bear Creek drainage compared to those in roaded areas. The authors provided conclusions regarding the effectiveness of current practices in reducing sediment impacts and recommendations for erosion prevention and control with emphasis on "storm-proofing" roads.

The PWA's report described the role of large storms as triggering mechanisms for large landslides and other processes that contribute large quantities of sediment including debris landslides, torrent tracts, streambank erosion along Bear Creek and road fill and crossing failures and diversions. The report acknowledged that the investigation did not attempt to systematically quantify the volume of sediment discharged in conjunction with forest management activities including surface erosion and small slides. Sources of this sediment include surface erosion on roads, skid trails, cable yarding corridors as well as watercourse crossings that have recurrently failed and have been replaced. Discharge from these sources would be expected to be most acute during winter storms including in the years between the episodic storm events (e.g., those that caused flooding in 1955, 1964 and other years). The DFG recognizes that this acknowledged limitation of the investigation was a necessary consequence of the methods and resources that were employed, however, it brings into question the report's conclusions regarding the role of the current California Forest Practice Rules (FPRs) and the company's timber operation practices in contributing to declines in sediment production.

When considering the changes in the FPRs and timber operations over recent years, the primary areas of improvement include the establishment of watercourse and lake protection zones (WLPZs), new road construction techniques, criteria used for locating new roads and

limitations on where ground-based yarding can occur. For some circumstances many of these changes appear to have led to improvements in avoiding or limiting the frequency, size and the effects of landslides and surface and fluvial erosion associated with roads and skid trails.

As the report made very clear, however, the investigation identified inner gorge mass wasting features on harvested slopes, where roads and skid trails are largely absent, as the primary sources of sediment discharge in the Bear Creek watershed. The hillslope failures resulting from the 1996/1997 winter storms confirm that the recent changes in regulations and management have not protected instream aquatic habitat or "storm-proofed" salmonid population recovery. The PWA report indicated that 37 percent of Bear Creek basin has been harvested within the last 15 years and that 85 percent of the sediment from landslides that discharged into Bear Creek and its tributaries during the winter of 1996/1997 originated within this harvested area. Consequently, the improvements in the FPRs and changes in harvest practices do not appear to have been directed toward addressing the dominant sediment delivery mechanism of Bear Creek. Further, with the important exceptions that relate to the FPRs' improvements and practices pertaining to roads, the report did not specifically investigate many of the improvements that the FPRs are said to afford in potentially reducing surface and fluvial erosion. At the very least then the report's conclusion that the FPRs and better road construction and location are having a measurable and significant effect on reducing long-term downward trend in accelerated sediment production should be qualified.

We concur with PWA's geological assessment that natural rates of land sliding are high within the region. The occurrence of mass wasting events in the 1996/1997 winter within Humboldt Redwoods State Park showed a high incidence of ground disturbance but, when compared to managed timberlands, the magnitude was far less (refer to the August 21, 1997, letter from the California Division of Mines and Geology to Deputy Director Craig Anthony, CDF). As a result of the 1996/97 flood events in Bear Creek, landslides also activated ancillary erosional processes involving the stream channel. Bank erosion was reported small (14,000 yds^3), in comparison to the overall sediment budget, but caused an average increase in channel width of 2.4 feet with a range of one foot to 30 feet and complete scour of riparian vegetation. The instream habitat remaining in Bear Creek after the winter of 1996/1997 could only support fish assemblages typical of disturbed ecosystems.

Fine sediment, which according to the report accounts for one to two percent of the sediment budget, is significant enough to reduce spawning success and instream insect production. Evaluating the role of forest management activities, however, in creating sources of chronic, albeit, (in terms of volume of sediment) relatively minor erosion and its influence on aquatic species and their habitat, both in the main stem of Bear Creek and in its tributaries, was beyond the scope of the investigation. A total of one to three coho salmon were observed in Bear Creek in 1987/88 and 1991/92 carcass surveys, but juveniles have not been observed during summer fish surveys in Bear Creek. This could be due, in part, to the limited sampling protocol associated with habitat typing inventory, but it may also reflect poor reproductive and rearing conditions prior to the 1996/1997 winter, associated, in part, with fine sediment.

The PWA report stated that approximately one-half (160,100 yds^3) of the estimated 332,900 yds^3 filling the Bear Creek channel had scoured and washed into the Eel River during the winter of 1997/98. However, they also indicated that great quantities of landslide deposits still reside in the Bear Creek channel. Additional sediment within tributary drainages, which experienced large landslides, is stored at the foot of slopes and in channel reaches, which might take many years to mobilize and flush out of the system. The creation of shallow riffle habitat with warmwater temperatures deteriorated the recovery of Bear Creek as a salmon stream.

The instream habitat survey conducted by the DFG in 1991 reported that riffles, pools and flatwater comprised 38 percent, 35.4 percent and 26.4 percent, respectively, by occurrence and 48.9 percent, 30.3 percent and 20.4 percent by length. A total of 100 pools had a depth of two feet or greater. Stream temperatures were adequate at the time of this habitat inventory but since then temperature conditions for salmon have deteriorated. There is no data available to compare Bear Creek today with prior habitat conditions. Bear Creek habitat conditions in 1991 were typical of a coho ecosystem in recovery, however, today the habitat can only be classified as severely impacted.

Despite the dominant role of inner gorge mass wasting features in contributing channel modifying quantities of sediment and setting back recovery of salmonids and other aquatic species, the investigation did not explicitly attempt to identify the role of forest management and the mechanisms involved (e.g., removal of crown cover, loss of root strength, ground disturbance during yarding, site preparation) in creating the conditions that interacted with the episodic storm events that formed and triggered these features in the Bear Creek drainage. As stated above, however, the report did present a strong association between mass wasting in unroaded inner gorges and recent harvest history, which we infer, based on occurrence of the steep slopes and our review of the drainage, primarily involved cable yarding systems. Rather than attempting to identify these interactions and mechanisms and then present recommendations for modifying management practices implicated in contributing to mass wasting, the report deferred to the "*Mass Wasting Avoidance Strategy for the Interim Period*" which is a component of the Pacific Lumber Company's "Interim Aquatic Avoidance Strategy for Timber Harvest and Roads."

The DFG concurs that the *Mass Wasting Avoidance Strategy for the Interim Period* is promising as long as alternative prescriptions from the strategy do not increase the risk of mass wasting. To date, compliance with the provisions of the strategy has been incomplete. Notwithstanding that we anticipate improvements in the strategy as the company gains experience with implementing it. Based on the current conditions in Bear Creek and its tributaries and experience with recently amended THPs, the DFG does not concur that a risk assessment performed by the Pacific Lumber Company's foresters and geologist will be sufficient, absent concurrence by the DFG or National Marine Fisheries Service. Based on this report and the DFG's assessment of current conditions in the Bear Creek watershed, the strategy's default prescriptions should be applied in most, if not all, of the THPs in this watershed.

Procedures capable of causing sediment input into watercourses, including activities such as winter crossing installation, winter road and landing construction, wet weather use of WLPZ roads or harvesting on steep inner gorge slopes, should be avoided in the Bear Creek watershed.

The report presents elements of the company's "Bear Creek Monitoring Plan." Insufficient detail was presented for the DFG to evaluate to what extent the plan has merit. We recommend that the monitoring plan include specific goals and objectives as well as hypothesis to be tested through monitoring. The plan should describe methods, techniques, precision and frequency of reporting. In addition, the plan should explicitly include provisions for monitoring hillslope processes, channel morphology, in- and near-stream habitat parameters as well as habitat structure (e.g., pool frequency, depth, cover, spawning gravel) to collectively assess changes in habitat conditions. Finally, the plan should at least provide an outline of how the results of monitoring would be employed to inform the company as well as the reviewing agencies and the public of how management activities would be modified over time. The DFG is available to assist the company and other agencies to develop a complete monitoring plan.

If you have any questions regarding our comments, please contact Environmental Services Supervisor Mark Stopher at (530) 225-2275 (CALNET 442-2275). Thank you.

Donald Koch

Donald B. Koch
Acting Regional Manager

cc: See attached list.

The DFG's comments and recommendations are based on our review of the documents, information in the DFG's stream survey files, field observations of Bear Creek adjacent to the THP and aerial photographs of the subject THP area and the Bear Creek watershed. The DFG did not participate in the preharvest inspection for the plan.

THP Checklist

CLASS I STREAMS

The response to the checklist item regarding channel migration zone (CMZ) refers to Plan Addendum to Item No. 26, dated June 3, 1998, which states "...No channel migration zones were noted in the plan area or adjacent to the watercourses which are protected with "no cut" WLPZs under this THP." A view of photographs taken on the ground and of several aerial photographs suggests that establishing a CMZ along Bear Creek adjacent to the THP would be appropriate. Where CMZs are established, the Class I watercourse and lake protection zone (WLPZ) begins at the outer margin of the CMZ. The DFG therefore recommends that the Bear Creek corridor adjacent to the subject THP area be evaluated by Pacific Lumber Company using a qualified fluvial geomorphologist who has expertise in channel migration. Depending upon the geomorphologist's evaluation of the Bear Creek corridor adjacent to the plan, the DFG recommends that the THP make one of the following findings:

1) Based on the Aquatic Strategy's definition of CMZ, a CMZ along Bear Creek in the vicinity of the plan area harvest units is not necessary and, as such, the harvest unit boundaries are beyond (upslope from) the 170-foot Class I WLPZ width along Bear Creek.

2) Based on the Aquatic Strategy's definition of CMZ, a CMZ has been mapped for Bear Creek adjacent to the plan area harvest units. No portions of any harvest units fall within 170 feet of the CMZ and no adjustment to silvicultural prescriptions is necessary.

3) Based on the Aquatic Strategy's definition of CMZ, a CMZ has been mapped for Bear Creek adjacent to the plan area harvest units. Portions of the harvest units fall within 170 feet of the CMZ and silvicultural prescriptions have been adjusted per the Aquatic Strategy for Class I WLPZs and are described in Plan Addendum to Item No. 26, dated June 3, 1998.

CLASS II STREAMS

With regard to Class II springs and seeps outside Class II WLPZs, please disclose criteria used to evaluate habitat for nonfish aquatic species and disclose methods employed to infer absence of nonfish aquatic species. The DFG recommends that all Class II springs be afforded the same protection as Class II watercourses.

The checklist refers to page 31, Plan Addendum to Item No. 26, dated June 3, 1998, with reference to "full suspension unless demonstrated to be infeasible." However, page 31 is silent on this measure.

ALL CLASS I/II WLPZ HARVEST

If logs are yarded across any Class I or II WLPZ, the DFG recommends that the Addendum to Item No. 26 on page 31 of the June 3, 1998, THP revision state that only full suspension yarding will occur as per the Aquatic Strategy.

The THP checklist refers to page 12 with regard to retention of all nonhazard snags. The Aquatic Strategy, however, requires that, within Class I WLPZs, no sanitation salvage occurs and all nonhazard snags be retained. Snags felled for safety concerns should be left on the ground. The DFG recommends that Item 33 on page 12 of the THP be revised to include these requirements of the Aquatic Strategy.

The response given to the checklist item "Retain all non-hazard snags (Class I only)" is "N/A." This response was given, presumably, because no Class I WLPZs are identified as occurring in the THP area. One hundred feet on each side of roads appurtenant to the plan area, however, are considered as part of the area of the THP. Based on our review of the THP maps, the THP appurtenant roads do pass through WLPZs. The Aquatic Strategy requires that no sanitation salvage occur within WLPZs and that "felled hazard trees and snags not associated with a THP are considered down wood and are to be retained in the general vicinity." Also, the Aquatic Strategy prescribes for Class I WLPZs "Retain all non-hazard snags, as per the snag policy of the HCP." The DFG recommends that Item 33 on page 12 of the THP be revised to require that no sanitation salvage occur within WLPZs, that all nonhazard snags be retained within Class I WLPZs and that hazard snags that are felled be retained "in the general vicinity."

The THP checklist refers to page 22 of the revised Plan Addendum to Item No. 16, dated June 1, 1998, with regard to the installation of water bars on cable roads that channelize runoff that reaches watercourses. The revised addendum states "Cable roads that channelize runoff that reaches watercourses will have water bars installed." The DFG recommends that the addendum include the following wording from the Aquatic Strategy

> Cable corridors (cable roads) that divert or carry away from natural drainage patterns or channelize runoff that reaches watercourses shall have waterbreaks installed at intervals as per skid trail prescriptions by Weaver et al. (1994).

CLASS III STREAMS

The DFG recommends that the revised THP on page 5, Item "f", under "Broadcast Burning Addendum" include "EEZs" (equipment exclusion zones) along with the equipment limitation zones (ELZs) as zones in which no ignition will occur.

97-487

State of California

Memorandum

Date : July 22, 1998

To : California Department of Forestry and Fire Protection
Humboldt Ranger Unit
118 Fortuna Blvd. Fortuna, California 95540

Attention: Review Team Chairperson

From : Department of Fish and Game - Region 1 Environmental Services, Timber Harvest Review Program, Eureka

Subject : Timber Harvest Plans in Bear Creek, Tributary to Eel River

This memorandum is to notify the California Department of Forestry and Fire Protection (CDF) Review Team Chairperson that the Department of Fish and Game (DFG) remains concerned with the extremely poor suitability of Bear Creek as coho, chinook, and steelhead spawning and rearing habitat. It is still the opinion of the DFG that, until habitat conditions are suitable to sustain populations of salmon and steelhead in Bear Creek, no timber harvest plans be approved which have the reasonable potential to add to existing significant cumulative sediment effects and impede recovery.

In particular, the DFG does not believe that THP 1-97-487, which is located within the middle reaches of Bear Creek, will avoid adding to existing significant cumulative sediment effects in Bear Creek.

As the DFG stated in our October 8, 1998 memo to CDF, (copy attached) we believe that CDF should deny timber harvest plans within the Bear Creek watershed, including those under review at this time, that do not clearly demonstrate that they: 1) will **not** have a reasonable potential to add to past, present, or reasonably foreseeable cumulative sediment effects to Bear Creek's anadromous fish habitat, including habitat for coho salmon, and 2) will **not** impede recovery of coho salmon and their habitat. Our October 8, 1998 memo also recommended that CDF deny plans in the Bear Creek watershed unless they clearly demonstrate that they will avoid the discharge of any sediment into Bear Creek or its tributaries. The DFG still stands by this recommendation.

The Department believes that even without the proposed plan, existing significant cumulative sediment effects in Bear Creek are impeding and will continue to impede recovery of coho, chinook, and steelhead. The increased level of sediment which the DFG believes will be

discharged into Bear Creek as a result of this plan, in combination with ongoing sediment impacts to Bear Creek from existing sources, will further impede recovery of coho, chinook, and steelhead and their habitat in Bear Creek.

The DFG does not agree that, in spite of some channel down cutting through the sediment terraces which resulted from the 1997 debris torrents and other sediment inputs, Bear Creek's anadromous fish habitat has recovered. Bear Creek remains severely temperature and sediment impaired, and lacks habitat complexity elements which are required for coho, steelhead, and chinook. The DFG maintains that, even with treatment, continued acute and chronic sediment input from existing slides, debris torrent scarps, roads, and inner gorge failures are likely to continue into the foreseeable future.

The Department will be available to discuss these issues and provide further analysis upon request. Should you have any questions, please contact Environmental Services Supervisor Mr. Mark Stopher at (916) 225-2233, Environmental Specialist III Mr. William Condon at (707) 441-5671 or Environmental Specialist III Mr. Mark Moore (707) 441-2060.

Mark R. Moore

Mark R. Moore
Environmental Specialist III

cc: RWQCB: Reichmuth NMFS: Rutten, Kramer CDF: Harris

State of California

Memorandum

UNIT,FG,WQ G(R)

To : Mr. Glen J. Newman, Chief
Coast/Cascade Region
California Department of Forestry and Fire Protection
Post Office Box 670
Santa Rosa, California 95402-0670

Attention Mr. Thomas Osipowich

Date : August 24, 1998

Received

AUG 27 1998

Humboldt-Del Norte R.U.
Resource Management

From : **Department of Fish and Game - Region 1**
601 Locust Street, Redding, California 96001

Subject : **Amended** Review of the "Pacific Lumber Company/Scotia Pacific Holding Company THP Checklist" and "Mass Wasting Avoidance Strategy" for Timber Harvest Plan (THP) 1-97-487HUM, "MID AIR.BEAR," Scotia Pacific Holding Company, in Light of Existing Watershed Conditions

In the previous August 17, 1998, memo to you on this THP, two word processing errors were overlooked in final preparation. These have been corrected in this memorandum. Your attention is directed to page three, paragraph six, first sentence (under **CLASS III STREAMS**) and page six, paragraph two, second sentence.

This memo follows previous correspondence to the California Department of Forestry and Fire Protection (CDF) from the Department of Fish and Game (DFG) regarding degraded habitat conditions for salmon and steelhead in Bear Creek and the appropriateness of approving THPs in light of these conditions. Previous correspondence to CDF from the DFG regarding Bear Creek includes an October 8, 1997, memo regarding fish habitat conditions, a July 21, 1998, memo regarding the Pacific Lumber Company's sediment source investigation and reduction plan for the Bear Creek watershed and a July 22, 1998, memo to the CDF Review Team Chairperson regarding THP 1-97-487HUM in Bear Creek.

The DFG's October 8, 1997, memo observed that anadromous fish habitat in Bear Creek is severely degraded. In addition, the DFG recommended that the CDF not approve THPs within the Bear Creek watershed (which includes those under review at this time) that do not clearly demonstrate that they: (1) will **not** have a reasonable potential to add to past, present or reasonably foreseeable cumulative sediment effects to Bear Creek's anadromous fish habitat including habitat for coho salmon and (2) will **not** impede recovery of coho salmon and their habitat. Our memo also recommended that the CDF not approve plans in the Bear Creek watershed unless they clearly demonstrate that they will avoid the discharge of any sediment into Bear Creek or its tributaries.

We have evaluated the "Pacific Lumber Company THP Checklist" (checklist) and "Mass Wasting Avoidance Strategy" for the subject THP and the documents attached to a letter dated June 16, 1998, from Mr. James P. Adams, the author of the THP, as provided for in the "Pre-Permit Application Agreement in Principle." The purpose of this review was to evaluate compliance with the "Interim Aquatic Strategy for Timber Harvest & Roads for the Pacific Lumber Company" (Aquatic Strategy). The DFG's comments, questions and recommendations developed from our review are presented below.

RECEIVED

State of California

The Resources Agency

Memorandum

To: Mr. Dave Ebert
Ranger Unit Chief
Humboldt-Del Norte Ranger Unit

Date: September 11, 1998
R43

Attn: Mr. John Marshall
Resource Manager
Humboldt-Del Norte Ranger Unit

Telephone: ATSS( )453-9455
(916)653-9455

From: Department of Forestry and Fire Protection

Subject: 5400 FOREST PRACTICE REGULATION
5410 Forest Practice Act
Freshwater Creek Cross-Section Remeasurement

Background Information

This memorandum reports the results of field work completed on August 19-20, 1998 by Hugh Scanlon and Pete Cafferata, CDF, in the lower Freshwater Creek basin. The purpose of the project was to remeasure three cross-sections established by the U.S. Army Corps of Engineers (ACE) in 1975. The ACE included these cross-sections in their report titled "Flood Plain Information, Freshwater Creek, Humboldt County, California." These cross-sections (along with 6 others that were not included in the report) were established at that time to aid in the determination of the extent of the flood plain defined by a 100-year recurrence interval discharge event. The ACE's goal was to promote proper land use planning and management decisions regarding flood plain utilization in the Freshwater Creek basin.

The cross-sections included in the ACE report are shown in Figures 1 and 2. We were unable to locate bench marks for these cross-sections, so remeasurements here are only approximations of the exact locations surveyed in 1975. We used an engineering level, Philadelphia rod, and 300 foot nylon tape for measuring the cross-sections (equipment provided by Humboldt State University's School of Forestry). Brief descriptions of each site follow, as well as our interpretations of the data collected.

Cross-Section No. 3

Cross-section no. 3 was established by the ACE at river mile 2.74 (river mile was defined by the ACE as miles above Freshwater Corners; Freshwater Slough

begins slightly below this point). Based on maps and diagrams included in the ACE (1975) report, we determined that the location of this cross-section was approximately 1000 feet below Howard Heights Bridge at a bend in the channel (see Figure 3). Channel gradient at this location is 0.2 percent (as determined from Figure 4). Abundant willow trees and blackberry thickets made surveying at this location extremely difficult, and we were able to make measurements over about 120 feet, compared to the ACE's cross-section distance of 800 feet. We are relatively confident that we established the cross-section in roughly the same location reported by the ACE, but clearly the remeasurement is only an approximation. Additionally, since actual reference datums were not available for this survey work, we simply assumed that the elevation of high right bank just above the channel where the instrument was set up remained constant and could serve as an approximate reference elevation. Figure 5 shows the comparison of the 1975 cross-section with the 1998 cross-section. Very minimal channel aggradation is shown, with some evidence that the thalweg may have shifted slightly toward the right bank (looking downstream). Since the location for this cross section was at a bend in the channel in a low gradient flood plain, thalweg migration would be expected to occur at this location. Rivers move laterally in a flood plain by erosion of one bank and simultaneous depositions on the other. Throughout the process of lateral movement, the channel generally maintains a similar width and depth (Dunne and Leopold 1978).

Cross-Section No. 5

Cross-section No. 5 was established at river mile 3.74. Based on maps and diagrams included in the ACE report, we determined that this cross section was originally located approximately 600 feet above the confluence of Little Freshwater Creek (Figure 6). Channel gradient at this location is approximately 0.2 percent. The creek at this location has multiple over-flow channels, with sediment terraces spread over several hundred feet in the flood plain. It is obvious that the dominant channel will change over time as sediment routing occurs, and this appears to have been documented with our cross-section remeasurement. In 1975, the deepest channel was located near the right bank (looking downstream), while in 1998 the dominant channel was found further towards the left side of the flood plain. We surveyed about 300 feet at this location, compared to the ACE's survey of 700 feet. Again, since actual reference datums were not available, we assumed that the elevation of a levee on the right bank remained constant and could serve as an approximate reference datum. Based on a comparison of the two cross-sections, it appears that approximately one foot of fine sediment may have accumulated at this low gradient location (Figure 7), although no volume calculations were made to determine mean bed elevation change.

Cross-Section No. 7

Cross-section no. 7 was established by the ACE at river mile 4.70. Based on maps and diagrams included in the ACE report, we determined that the location of the cross-section was approximately 50 feet above the Freshwater Park Bridge (of the three cross-sections, we have the highest confidence in this location—since it can be tied to an existing structure). Channel gradient at this location is approximately 0.8 percent. Due to the maintenance associated with Freshwater Park, the terrain was relatively open and we were able to survey about 350 feet, compared to the ACE's 450 feet. We assumed that the elevation of the terrace on the left side of the channel (looking downstream) remained constant and could serve as a reference datum. Based on a comparison of the two cross-sections, it appears that the channel has degraded at least two feet, and that the sediment has been moved downstream from this location (Figure 8).

Conclusions

The conclusions that can be drawn from this project are limited due to the approximations and assumptions necessary for remeasurement. If the original survey notes could be obtained from the ACE, these three cross-sections, and perhaps the other six that were established in 1975, could be surveyed with considerably higher confidence. As further watershed studies and/or watershed analysis is completed in the Freshwater Creek basin, this information may be able to be obtained and further work completed to document channel changes that have occurred over the past 23 years.

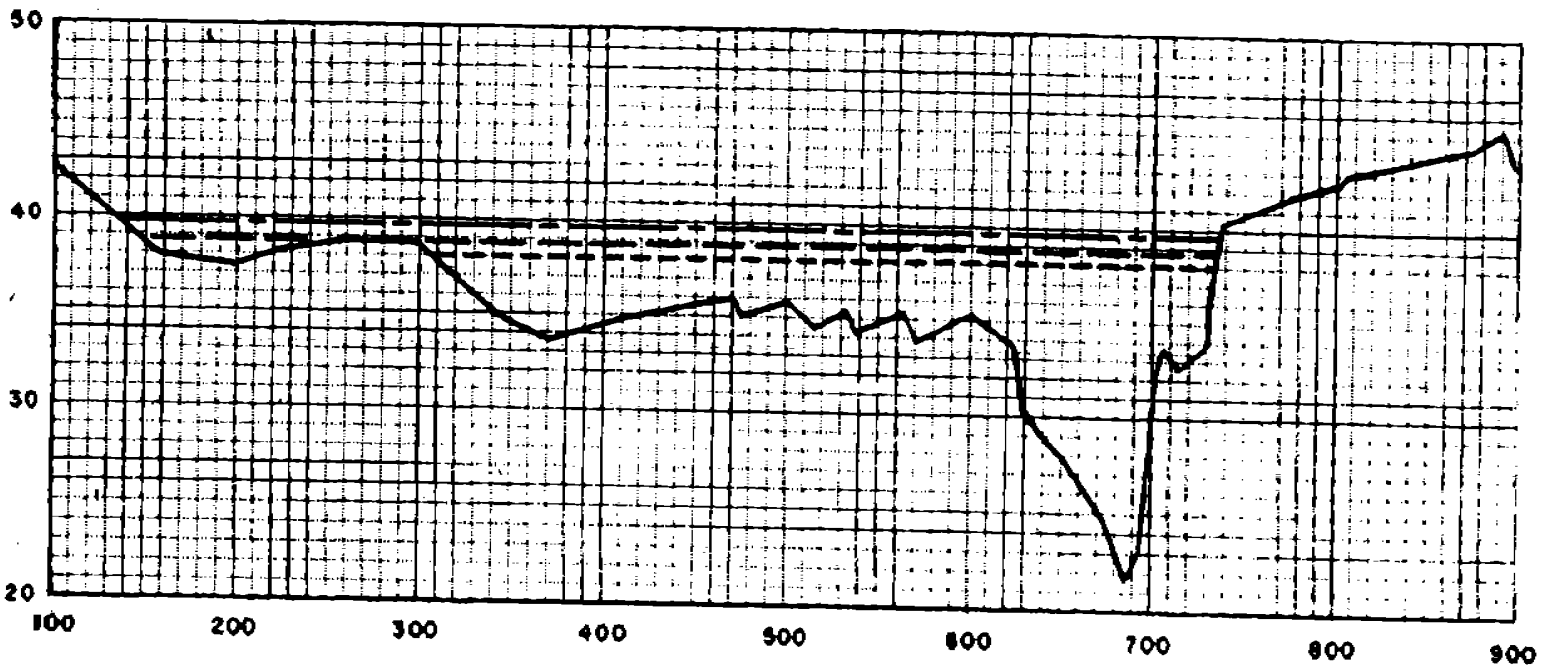
Based on the qualifications stated above, our limited conclusions are that these cross-sections suggest that only minor channel aggradation may have occurred in the lower gradient reaches of Freshwater Creek, perhaps on the order of six inches to one foot. Some antidotal evidence presented to CDF over the past year has further suggested that this level of channel filling may have occurred. As part of a long-term instream monitoring program in the Freshwater Creek watershed, both well documented longitudinal and cross-sections should be established and monitored over several decades to provide verifiable data regarding sediment movement and storage in the lower part of this basin.

References:

Dunne, T. and L.B. Leopold. 1978. Water in environmental planning. W.H. Freeman and Co., San Francisco. P. 605-606.

U.S. Army Corps of Engineers. 1975. Flood plain information, Freshwater Creek, Humboldt County, California. Final report prepared for Humboldt County by the U.S. Army Engineer District, San Francisco, CA. 14 p.

Figure 1



LEGEND

STANDARD PROJECT FLOOD

INTERMEDIATE REGIONAL FLOOD

50 YEAR FLOOD

SECTIONS TAKEN LOOKING DOWNSTREAM

DEPARTMENT OF THE ARMY
SAN FRANCISCO DISTRICT, CORPS OF ENGINEERS
SAN FRANCISCO, CALIFORNIA

FLOOD PLAIN INFORMATION
HUMBOLDT COUNTY
CALIFORNIA

SELECTED CROSS SECTIONS
FRESHWATER CREEK
OCTOBER 1979

PLATE 8

Figure 3

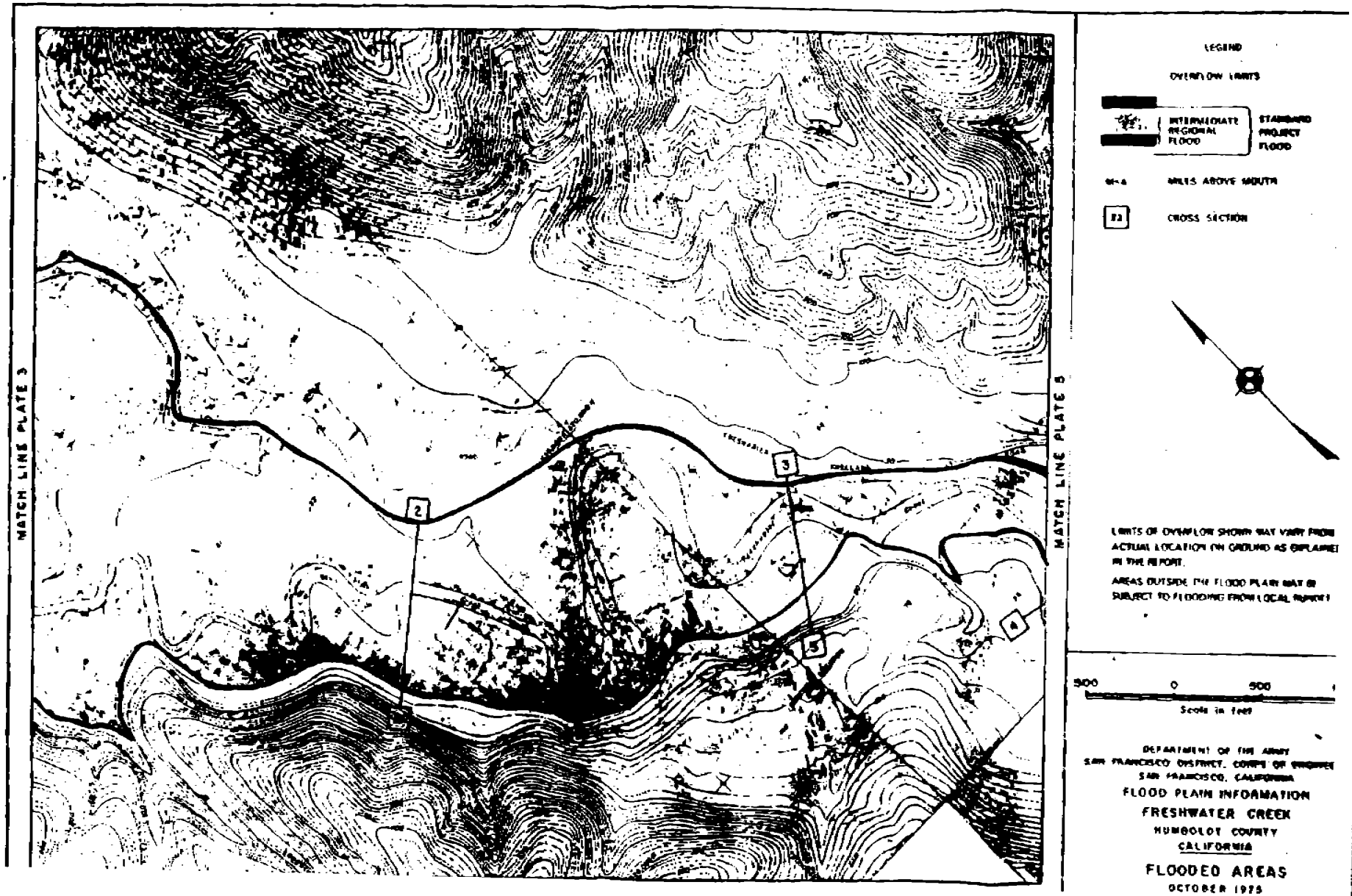
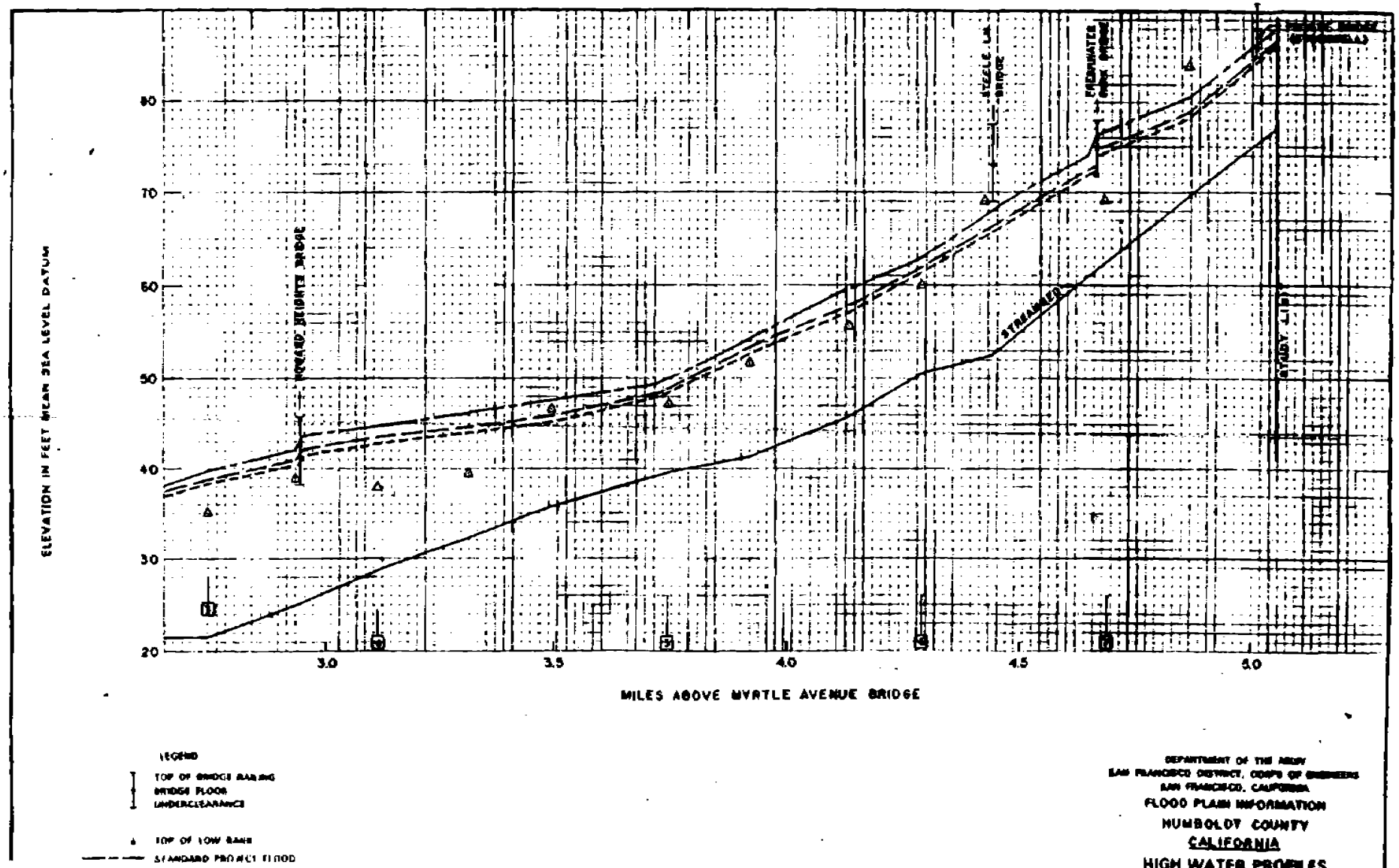

MATCH LINE PLATE 3
MATCH LINE PLATE 5
LEGEND
OVERFLOW LIMITS
INTERMEDIATE REGIONAL FLOOD
STANDARD PROJECT FLOOD
MILES ABOVE MOUTH
CROSS SECTION
LIMITS OF OVERFLOW SHOWN MAY VARY FROM ACTUAL LOCATION ON GROUND AS EXPLAINED IN THE REPORT.
AREAS OUTSIDE THE FLOOD PLAIN MAY BE SUBJECT TO FLOODING FROM LOCAL RUNOFF
500 0 500
Scale in feet
DEPARTMENT OF THE ARMY
SAN FRANCISCO DISTRICT, CORPS OF ENGINEERS
SAN FRANCISCO, CALIFORNIA
FLOOD PLAIN INFORMATION
FRESHWATER CREEK
HUMBOLDT COUNTY
CALIFORNIA
FLOODED AREAS
OCTOBER 1975

Figure 4


ELEVATION IN FEET MEAN SEA LEVEL DATUM
80
70
60
50
40
30
20
3.0
3.5
4.0
4.5
5.0
MILES ABOVE MYRTLE AVENUE BRIDGE
HOWARD HEIGHTS BRIDGE
STEELE LN BRIDGE
FRESHWATER
STRAIGHTED
STUDY LIMIT
LEGEND
TOP OF BRIDGE RAILING
BRIDGE FLOOR
UNDERCLEARANCE
TOP OF LOW BANK
STANDARD PROJECT FLOOD
DEPARTMENT OF THE ARMY
SAN FRANCISCO DISTRICT, CORPS OF ENGINEERS
SAN FRANCISCO, CALIFORNIA
FLOOD PLAIN INFORMATION
HUMBOLDT COUNTY
CALIFORNIA
HIGH WATER PROFILES

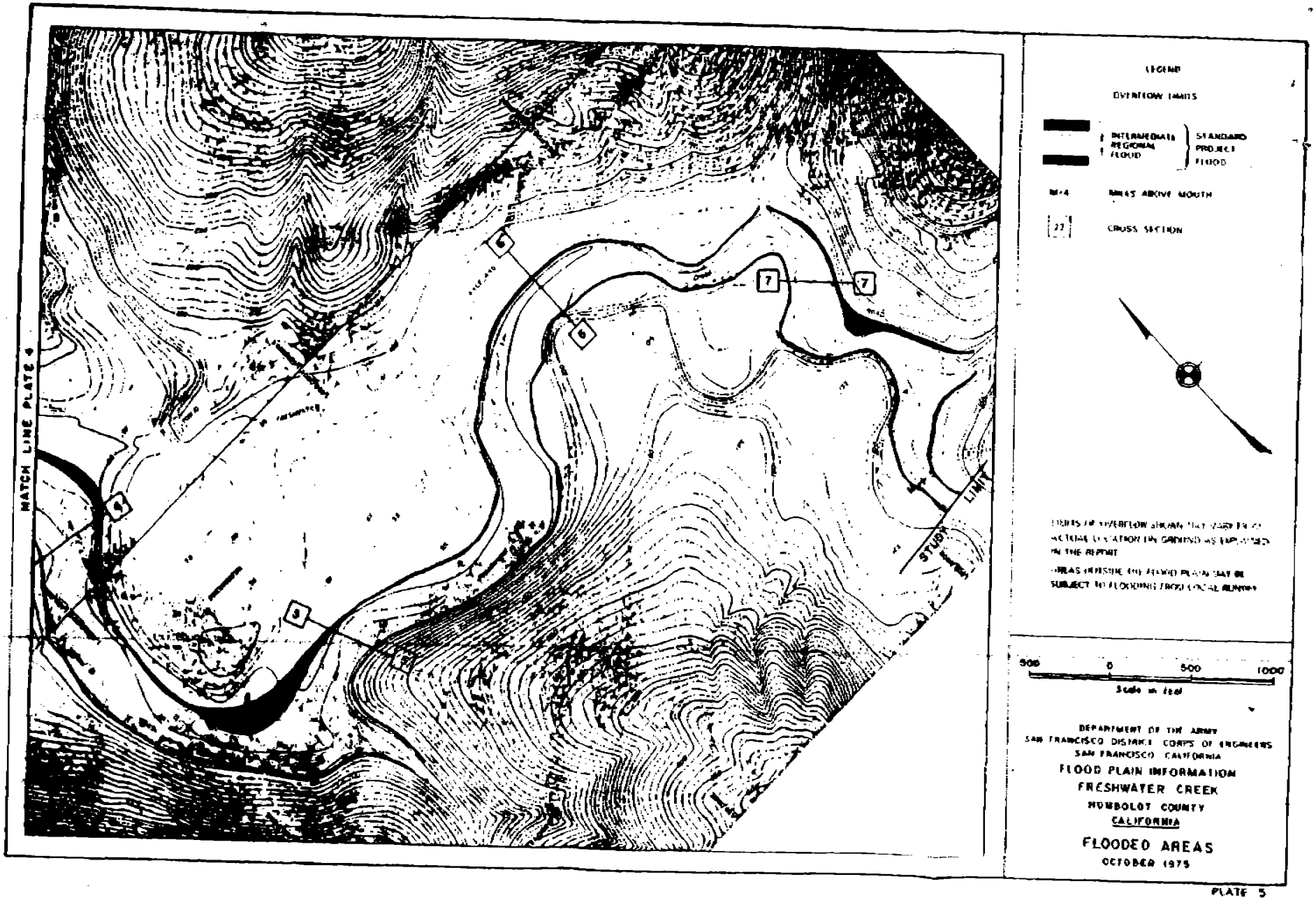

MATCH LINE PLATE 4
STUDY LIMIT
LEGEND
OVERFLOW LIMITS
INTERMEDIATE REGIONAL FLOOD
STANDARD PROJECT FLOOD
MILES ABOVE MOUTH
CROSS SECTION
500 0 500 1000
Scale in feet
DEPARTMENT OF THE ARMY
SAN FRANCISCO DISTRICT CORPS OF ENGINEERS
SAN FRANCISCO CALIFORNIA
FLOOD PLAIN INFORMATION
FRESHWATER CREEK
HUMBOLDT COUNTY
CALIFORNIA
FLOODED AREAS
OCTOBER 1975
PLATE 5

Figure 6

Figure 7

Freshwater Creek Cross Section No. 5

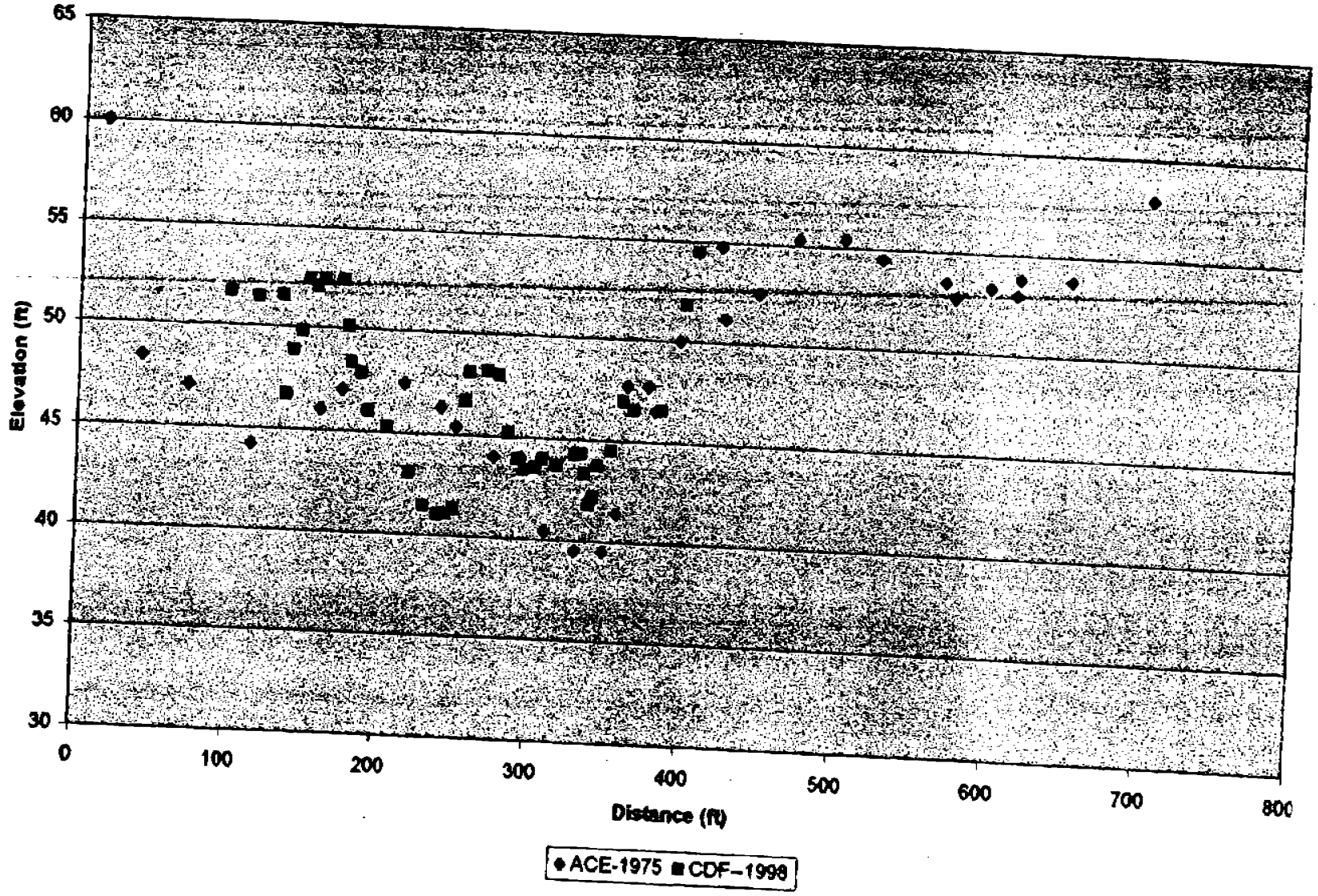
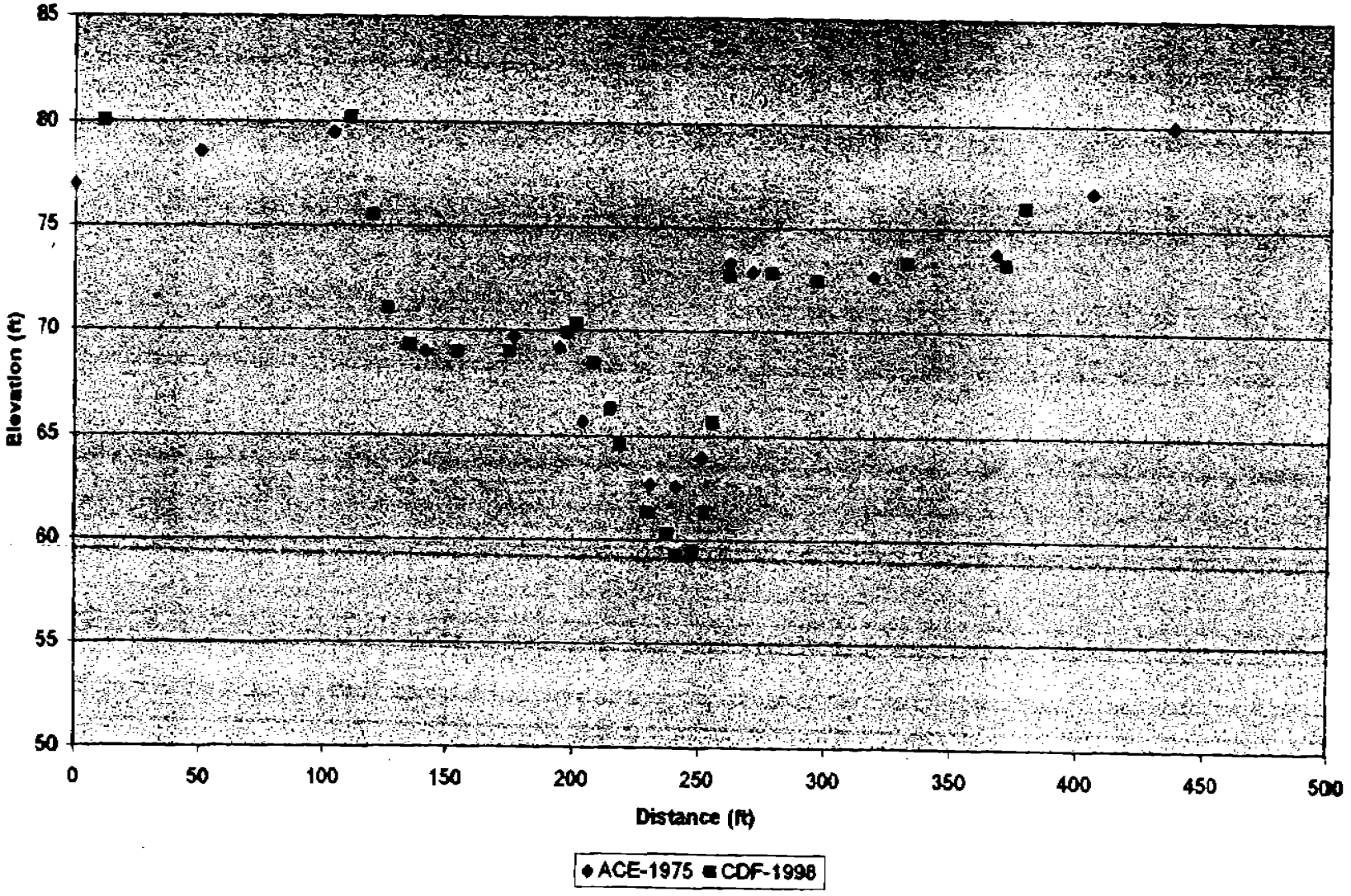


Figure 8

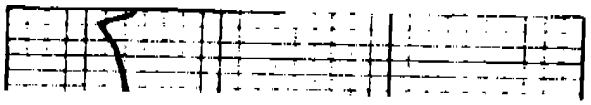
Freshwater Creek–Cross Section No. 7



Peter H. Cafferata
Forest Hydrologist
Sacramento Headquarters

Hugh Scanlon
Forester I
Humboldt-Del Norte Ranger Unit
Fortuna

cc: Mr. Dean Lucke, CDF Santa Rosa
Mr. Tom Osipowich, CDF Santa Rosa
Mr. Tom Spittler, CDMG Santa Rosa



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THE ARMY
CORPS OF ENGINEERS
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FORMATION
COUNTY
IRNIA
SS SECTIONS
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1975